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Interview with
FREDERICK W. DITTUS
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Caltex Oral History Project

Frederick W. Dittus

Interviewer: Dr. Ronald E. Marcello Date of Interview: September 13, 1985

Place of Interview: Escondido, California

Dr. Marcello: This is Ron Marcello interviewing Frederick W. Dittus for the Caltex Oral History Project. The interview is taking place on September 13, 1985, in Escondido, California. I'm interviewing Mr. Dittus in order to get his reminiscences and recollections concerning his career in various capacities with Caltex.

Mr. Dittus, to begin this interview, just very briefly give me a biographical sketch of yourself. In other words, tell me when you were born, where you were born--that sort of thing.

Mr. Dittus: All right. I was born on December 27, 1897, in Frankfurt, Germany. I came over to this country at the age of fourteen in 1912 and landed in Los Angeles, where my father had been for two years prior. In other words, we were the typical immigrant family. The father came first; the oldest son next; my mother and my younger brother afterwards.

I got a job in a grocery store in Los Angeles. Not being able to speak English, I went to night school to learn

to speak English. After a year or so, I went to night school to learn anything I could, one of which was learning to make mechanical drawings.

Marcello: Had you always had an interest in this sort of activity?

Dittus: Yes. I used to draw in grammar school. My father was a wagon builder, or what you'd call in English, a wainwright. He used to have his own shop and draw up pictures of horse-drawn coaches that he would build. I used to copy them and got into that from that angle.

Of course, you don't sell coaches by the dozen. You sell one once in a while, so it was a case of having something to eat and then not having something to eat. That's one reason he left the old country, but still the automobile hadn't come in effectively.

He had two brothers, one in New Jersey and one in Wisconsin. The one in Wisconsin urged him to go out to California--Los Angeles--which he did. That was in 1910. At that time automobiles had open doors in the front and the like. The main job was to put doors on them so that you don't get cold and the like. The top was still open. There were no coupes then; they were all touring cars.

I went to night school, and one night some fellow came around and looked for a flunky, so to speak, to make blueprints and make drawings. He interviewed me and told me to go out to El Segundo and get a job there, which I did.

I've forgotten what it paid--\$12 or \$15 a week or something. I made blueprints--hand-made drawings in those days on tracing cloth. People don't know what tracing cloths are anymore. You made the drawing on big yellow sheets and then traced them on cloth in ink, and it was an art--almost.

Well, from there I took correspondence courses in engineering. I even took calculus in night school.

Marcello: Let me back up a minute. With what company were you working here in El Segundo?

Dittus: Standard Oil Company of California.

Marcello: And what year did this take place?

Dittus: That took place in March, 1916.

Marcello: Was this a full-time job?

Dittus: Yes, it was a full-time job--seven days a week, Saturday afternoons off (chuckle). In those days, in commuting from Los Angeles, you had to go along the railway and walk over the hill. Communication into El Segundo was practically nil--over a sand road.

Well, I took correspondence courses at the University of Wisconsin, and they weren't very good. So I became kind of a half-baked engineer. They didn't have engineers in refineries in those days; it was all a handed-down business.

Marcello: One of the names that keeps cropping up in the background information that I've examined is that of Henry D. Foster. What influence did he have upon your budding career at this time?

Dittus: Henry Foster was a very good man. He was a very religious man, and somehow he tolerated me, and during the war he made me chief of the drafting room, which consisted then of about twelve men or something. They were all older than I was. It was a little bit difficult, and my English wasn't too good yet. It even lacks some today.

Marcello: What was his particular function with Standard Oil of California?

Dittus: He was the chief engineer of the refinery. He used to come to work at 6:30 or 7:00 in the morning. He had on a piece of 8 1/2 x 11 sketches made up of what had to be drawn up and built. We worked from those sketches. He was a very hard-working individual. How did you get his name?

Marcello: I got it off of a small article that was given to me by the Caltex Public Relations Office. There was an article done on you--a feature. You were mentioning awhile ago that engineering relative to refineries and refinery building and construction at that time was rather primitive.

Dittus: Yes, it was. There were nothing but shelves--what we called shelf stills--where you put in the crude oil, and you boiled off one fraction that came overhead, ran it through a condenser where it was condensed and diverted to a certain tank. Then the next cut was taken, which was, I guess, the equivalent of coal oil distillate. Then the next one

that came was gas oil and the like. They were taken one after another. Then what was left went over into another section, the asphalt stills, which were operating under a vacuum and taking off some heavier oils yet--light fuel oils, I guess. Then the rest of it was asphalt, which was run through what they called asphalt coolers, which were tanks with water running over and then drawn off into wooden barrels. The asphalt was shipped then in those wooden barrels, and the wooden barrels were made right there in the cooper shop.

Marcello: At that time what were the principal fuels or products that refineries were turning out, that is, during that time you were at El Segundo with Standard Oil?

Dittus: Well, I guess they were gasoline, coal oil, and fuel oil. Most of the fuel oil, I guess, went to the Southern Pacific Railroad and the like to be burned on their locomotives. My knowledge of the oil end of it--what happened to it and the like--was still rather limited.

Marcello: You mentioned that while you were working here in the drafting department, you were taking correspondence courses and also going to night school. At that early stage, did you envision staying with Standard Oil of California for an indefinite period of time?

Dittus: Oh, yes. I figured that if I didn't get into trouble, I'd be with them (chuckle). I didn't envision that I would be

able to go to college, but in about 1920 there was a change taking place in the oil industry. The nationwide demand for gasoline products and so on became so high that it became necessary to cut, what we called, deeper into the oil; and the only way you could do it was to take the heavier fractions and then run them under high pressure and temperature to convert them to gasoline by what they call now cracking. They used to call it thermal cracking, and then nowadays you have catalytic cracking. I don't know what they have now. They have hydrogenation and everything else. I'm not familiar with it. After all, I've been out of it for twenty-some-odd years.

Marcello: So at this particular point, that is, from 1920 onward, we're really getting into the automobile age, and gasoline becomes a most important product.

Dittus: That's right. That's right.

Marcello: How did this change the nature of your work there at Standard?

Dittus: Well, it changed it because it became technical, and about all I could be was a draftsman, so to speak, or maybe the straw boss--what you called a straw boss--or a chief draftsman. They hired a bunch of young engineers from Berkeley, and also some other fellows that came from the East drifted into California and were looking for jobs.

There was a fellow by the name of Thornburg, who plays a role in Caltex, I guess. He became the chief engineer

at El Segundo.

There was one fellow that also played a role in Socal-- I'm not too familiar with it--and he was from the Hanna family, of which originally came from Franklin, Pennsylvania, and went out to Socal. The son of R.J. Hanna, who was Dick Hanna, went to...I don't know what school he went to, but he became the first technical man. He worked under a surveyor by the name of A.S. Russell, who was a civil engineer, I guess. I've forgotten where Russell came from. So the management changed and became more technical.

Marcello: Could you see at that point that if you were going to advance in Standard Oil of California, you were going to have to have more education in these technical fields?

Dittus: Well, I could see it, but I couldn't see my way clear of getting it (chuckle). Thornburg encouraged me to quit. At that time we had a stock plan, and I had \$1,000, so he encouraged me to quit. What's more, by some luck he found that the G.I.'s that were still coming back from World War I, that were studying engineering, didn't have high school mechanical drawing. So the university gave a noncredit course in mechanical drawing, and somehow or other I got the job of teaching them. This paid me \$45 a month, which was my room and board.

Marcello: Now this is something that you did once you went to the University of California at Berkeley?

Dittus: Yes.

Marcello: Let me back up just a minute. You went to high school at Los Angeles Polytechnic.

Dittus: Yes.

Marcello: Did you have mechanical drawing there originally?

Dittus: Yes, I had mechanical drawing at night. I never went there in the daytime. When I was fourteen, that was the end of my daytime education. Oh, one summer vacation I went there for a month or two, but I didn't have the money to keep it up. My folks didn't have the money. As a matter of fact, I was helping to support my folks.

Marcello: So you enter the University of California at Berkeley in 1922. You have \$1,000 that came from the stock plan, and you were going to be teaching mechanical drawing at night as a further means of supporting yourself.

Dittus: No, I taught that in the afternoon as a noncredit course. It was the equivalent of a laboratory course, you know, like chemistry or any of those things. They took it two afternoons a week. It must have been in the afternoon because I had morning classes.

Marcello: Now at that point, had you completely severed your ties with Standard Oil of California?

Dittus: Yes. I couldn't get a leave of absence. That kind of annoyed me. I was encouraged to quit, and I really cut loose all ties. It wasn't until I went with Caltex that

somehow or another they gave me credit for the time previously, as far as getting a watch and the like is concerned.

Marcello: Also, according to the record, however, you continued to work for Socal in the summertime. Is that correct?

Dittus: That's correct. I got a job during the summer and the winter vacation. I was very fortunate in that respect because in the following year, 1923, I got married. My wife went to school, too. By that time maybe I had gotten a raise for teaching, too, and I became a teaching fellow, so to speak, in descriptive geometry.

Marcello: Now by this time, had Henry Foster left the company, or was he still there?

Dittus: Oh, I think he was still there, and Thornburg was the assistant chief engineer. I think that's the way it was. I've forgotten when Henry Foster retired because after that I worked up in the Richmond refinery.

Marcello: I see. In other words, you were no longer working at the El Segundo refinery.

Dittus: No.

Marcello: So you had basically lost all contact with Mr. Foster then.

Dittus: Yes, more or less. Oh, later on I used to go down there on jobs, and I remember I dealt with Foster. But he was kind of relegated.

Marcello: Now of the two--that is, Foster and Thornburg--which one had the greatest influence on your career at this point?

Dittus: Oh, at that point it was Thornburg. There's no question about that.

Marcello: Because he was the one that had encouraged you to seek further education.

Dittus: Yes.

Marcello: What sort of a man was Thornburg?

Dittus: What sort of a man was Thornburg? He was a tall man. He was an ambitious man. I don't know how to describe him. I really can't. I don't know just how it happened, but he later became chief engineer of manufacturing.

I graduated in 1926, and then I took a year of post-graduate work. Then at night, in 1927 and 1928, I worked on a thesis, and in 1928 I got a master's degree. I was only one year in residence from 1926 to 1927, and during that time I had a job teaching descriptive geometry.

Marcello: Let me back up just a minute. Like you mentioned, in 1926 you received your B.S. degree in mechanical engineering.

Dittus: Yes, that's right.

Marcello: According to the record, you were perhaps thinking in terms of a career in college teaching at that point.

Dittus: Well, I was thinking about it, yes, but somehow or another I liked the physical process of building things and the like, so I decided to go back with Socal. I was encouraged by the dean of engineering and the like to stay on and teach, but to me it seemed like a dead-end proposition. I was more

interested in seeing things on the drawing board and then seeing them go up in the field.

Marcello: Let me ask you this. Is it accurate to say that the financial rewards of working in private industry at that were a lot better than they were in college teaching?

Dittus: Well, it could be, but I don't think that influenced me. I liked the company; I'd been with it since 1916. The university officials talked about my teaching aerodynamics and the like, but I wasn't particularly interested in aerodynamics. I was more interested in working in the field and the shops. In those days Socal didn't contract work to outside contractors to Bechtel and the like. They had their own boiler shop, their own machine shop. They built their own first hot oil pump. Nobody in the industry really built a hot oil pump with what they called the thermal cracker. It was developed by an engineer--"Pop" Lane--that worked at Richmond. They actually built in the shops at Richmond the hot oil pumps. Later on, that was taken over by people like the Byron Jackson Company and the like, which are now I don't know what. The pump industry as a whole learned how to build hot oil pumps.

Marcello: Let me ask you this. At that time, that is, back in the 1920's, which is the period we're talking about now, how much emphasis was Socal putting upon research and development relative to the kind of work you were doing?

Dittus: Quite a bit. That's when the research and development department was started by a fellow by the name of Ralph Halloran and an assistant that was an Austrian, A.K. Kremser. I had very little to do with that except that we worked with them. They developed the processes and turned over the information to the engineers. Then we designed furnaces and all the equipment necessary.

Marcello: Now in 1927 you rejoined Socal on a permanent basis.

Dittus: That's right.

Marcello: What kind of a position did you hold at that time?

Dittus: Oh, I was just an engineer on the staff of Thornburg, who was then chief engineer of the manufacturing department. We were handling design work, like, for a new refinery in El Paso. That was designed under the supervision of the chief engineer, not the local engineering departments, although the local engineering departments at El Segundo and Richmond make the drawings for it. That was under Thornburg's office. I was one of the engineers working under a fellow by the name of Frank Maker.

Marcello: Now where were you located at this time?

Dittus: At Richmond, California.

Marcello: You were still at Richmond.

Dittus: Yes.

Marcello: Also, I gather that you were in the meantime working upon a master's degree in mechanical engineering. Is that correct?

Dittus: Well, I graduated in 1926, and in 1927 I spent a year in residence to acquire the number of units necessary for a master's degree except the thesis. The thesis took quite awhile, and that I did at night by going down to the engine lab where they had a boiler and the like. I'd go there in the evening after dinner, at eight o'clock, and work until about ten or eleven or twelve o'clock on the thesis. That's how I accumulated all the information. I wrote a thesis in 1928, and I got the master's degree.

Marcello: What was the subject of your master's thesis?

Dittus: The subject of the master's thesis was "Heat Transfer in Viscous Fluid." Heat transfer in equipment for ordinary oils and the like was pretty well established, but a viscous fluid goes through a pipe like a sausage almost, but one sausage slips over another one so to speak. This was another problem, and there was no information available. That's why I picked that subject.

Marcello: Is this where we get into the famous Dittus-Boelter equation?

Dittus: (Chuckle) Gosh! Somebody did some research.

Marcello: I am, of course, completely ignorant of what we're talking about. Can you distill it or boil it down so that a layman who reads this interview might understand what we're talking about? Let's start with Boelter first of all. Who was he?

Dittus: Boelter? Well, I'll give you a book, and it gives his background. Boelter was, incidentally, my faculty advisor when I entered as a freshman (chuckle). He was younger than

I was. He came from Minnesota. I think he graduated from Berkeley and got his bachelor's degree at the age of eighteen or something. Well, you can find it in here somewhere [refers to book]. He was really interested in automotive engineering, and part of his job was to test all the gadgets people invented for motor vehicles: to turn the right-hand light and the left-hand light and all of this kind of stuff. The Department of Motor Vehicles appointed the University of California to test these gadgets. That was his job. Of course, he taught all about the internal combustion engine, and I don't know what all. I never took a course from him, so I never knew exactly.

In 1930 the company sent Frank Maker and myself to MIT for a summer session course, which was a strenuous proposition. MIT is well-known for its chemical engineering. I came back from there--Frank Maker and I--and I talked to Boelter and showed him pamphlets and the like of how they taught chemical engineering. Chemical engineering at the University of California was taught in the Chemistry Department by a fellow by the name of Randall, and it was more chemistry than engineering. So California didn't have much of a reputation as a chemical engineering school. Even Cal Tech had a better reputation.

So Boelter became interested in that through the heat transfer equation that I developed. He decided to teach

heat transfer and those courses in mechanical engineering since the subject also applies to mechanical engineers (power plants and the like). That's how he got into it, and he built up a tremendous following of students who worked on equations and the like on heat, thermodynamics and the like. That's how he got into it. When they opened up an engineering school at UCLA, he became the dean of engineering. This was a new concept in the University of California system--to have one engineering college that teaches everything. He was the dean of engineering, even though that one engineering college had departments of mechanical engineering, electrical engineering, civil engineering, mining, and the like. Now that's the way I sized it up. I never went to UCLA.

Marcello: Well, very briefly then--I'll ask one more time--what was the Dittus-Boelter equation (chuckle)?

Dittus: (Chuckle) Well, by the Dittus-Boelter equation, say, you had a piece of equipment and you had to transfer so much heat from one substance to another. One substance went around the tube. If the substance flowing through the tube was a very, very heavy oil like asphalt or a very waxy oil, then it would not convert into what they called a turbine flow. It was a streamline flow. By the test results, it was possible to coordinate it by certain factors considering viscosity, tube diameter, and the like, and calculate what

the transfer rate of heat from one side to the other was.

Now does that make it clear?

Marcello: Yes. How would that help so far as refineries were concerned? What would that contribute to the efficiency and the working of a refinery?

Dittus: Well, it meant that you could design the thing to proper size, and you didn't guess how much heat transfer surface to put into a peice of equipment. The calculated size of the equipment and the tube diameters and the like heretofore was kind of a guess business.

Marcello: How did the development of that equation contribute to your advancement with Socal?

Dittus: It didn't contribute at all. It didn't have any influence as far as I could tell (chuckle). It had some influence on the manufacturers of heat exchange equipment, the biggest one of which in the early days was C.F. Braun Company. There was a Doctor Eckert at Stanford who worked for C.F. Braun. C.F. Braun then became a very big contractor and is located now in Alhambra. Carl Braun had two or three sons that took over after he passed away.

Marcello: You mentioned a moment ago that Socal sent you and Mr. Maker to MIT for some summer work. Was this standard procedure for Socal at this time?

Dittus: No, it was not. As a matter of fact, it wasn't even a procedure at MIT. The guy that really was the father of

the chemical engineering, as far as the oil industry is concerned, was a fellow by the name of "Doc" Lewis. Quite a few of the students from MIT went to a practice school, I think, with Standard Oil of New Jersey over in the refinery at Bayonne in New Jersey. He got the idea and kind of rounded up and disseminated information to the various Standard Oil companies over the country. So we had in that class a bunch of fellows from the Standard Oil Company of New Jersey; we had two of us from Socal; there were some from the Humble Oil Company; there were a couple from Union Oil Company. It was quite an assortment. There were about forty people in that class. So we got pretty well acquainted with each other from different companies. It was a good thing from that point of view.

Marcello: So this was the first time it was done?

Dittus: That was the first time that I knew it was done.

Marcello: Then did it become a regular event later on?

Dittus: I couldn't tell you. I don't know.

Marcello: How did that kind of a joint seminar, if I may call it that, help you so far as your career with Caltex was concerned?

Dittus: Well, I had no education at all in distillation and fractionation and the like, and it helped me to get what the research and development department was doing. Even they, I think, were limited to a certain extent, although

they had some people from MIT in their organization. The engineering and research and development are two different branches in the oil industry generally.

Marcello: In other words, they put it on paper, that is, research and development puts it on paper, and engineering builds it.

Dittus: That's right.

Marcello: Now I also think that during this period Social sent you to the University of California at Berkeley once again, did they not?

Dittus: Oh, well, Frank Maker and I lived in Berkeley--both of us-- and instead of going to work at eight o'clock in the morning, we came at, say, ten o'clock or whatever time it was. We took an eight o'clock class in physics and learned about the physical aspect of the kinetic energies of molecules and the like. I've forgotten what the course was called. It was a regular physics course where you had thermodynamics, molecular energies, and all of that stuff.

Marcello: Now by this time we're about up to 1929, 1930, and entering the Great Depression. How did the coming of the Great Depression affect your work with Social?

Dittus: Well, that's kind of a sad story--the way it ended up--in my opinion, and this is really and truly about the first time I ever publicly discussed it. The president of the company was K.R. Kingsbury. He created a Department of Organization, commonly known as the "headhunters" among

people down below. It was headed up by a fellow by the name of Lou Purkey. Lou Purkey reported directly to K.R. Kingsbury and the board of directors. He started out by going through the Producing Department, which is the upstream end of the oil industry, and they cut out all the gardening that the company did on the cottages. In those days communication still was limited. The use of the automobile wasn't quite as extensive, but it wasn't as bad as it used to be. They had the cottages, and the company kept up the cottages, and the families lived in there--in camps I guess. I've never been in the producing end of it, but I kind of have a conception. Then from there they went to the Pipeline Department, and they streamlined it.

Marcello: Streamlining, in other words, means laying people off.

Dittus: Yes, that's it (chuckle). Then I guess the next in line was the Manufacturing Department. Gosh, I don't know how to put that now. They went through it and made certain recommendations, like, how to run the shops, how the storehouse was to be run--how they could be run more efficiently. They had paperwork devised so that if you took a screw out of the storehouse that cost a nickel, you had to fill out a piece of paper. I don't know. Whether it was actually quite as bad as that, I don't know. It ended up with a report that was at least a foot-and-a-half high anyway.

By that time A.S. Russell, who had been chief engineer

of manufacturing, was moved up to the board of directors. Thornburg, who was chief engineer of manufacturing in Richmond --I've forgotten just where he was--was moved over to San Francisco in some capacity. In any event, it ended up with the report being issued, and the report was to be put into effect.

Lo and behold, much to my surprise, I was picked to be the next chief engineer of manufacturing and put the report into effect. Now, you understand, the chief engineer of manufacturing was kind of a functional organization that reported to the San Francisco office to the general manager of manufacturing, as it was called, for the refineries. But then there was the refinery manager in each refinery, and he reported to the manager of refining in San Francisco who at that time was a fellow by the name of G.F. Brooks. I was picked, and I could just see when I was picked that the job wasn't going to be pleasant.

Marcello: In other words, you were going to be required to lay off some people.

Dittus: I was the guy that had to tell the guys that were "sour apples" who had been hired by the predecessors, and the lemon was passed on to me. I was fully aware of it; I didn't tell them that. This is the first time I've ever really let loose. I was just the fall guy. I had to go into the refineries and talk to the mechanical staff--not

the operating staff, but the fellows that ran the maintenance and ran the storehouse and the shops and the like--what all had to be done. The managers didn't like that, either. I wasn't welcomed by the manager, particularly the one at Richmond. Nobody knew that, either. As a matter of fact, the letters of congratulations I got, I didn't acknowledge them, and there was quite a bit of talk about the fact that I didn't acknowledge the congratulations and say "thank you" because really and truly, I didn't feel like "thank you." After the thing was over, I frankly thought, in my opinion, that I'd be bounced out.

I'm not bitter about it because I made a success of where I was bounced to. I'm proud of what I accomplished. Of course, one reason for that was the general manager, G.F. Brooks. He really had stayed on beyond retirement, and I suspect because the reason he stayed on was because he probably lost all of his investments to a certain extent in the stock market. I don't know. That's just speculation on my part. In any event, I was the fall guy.

Well, about that time, that begins to bring in Caltex.

Marcello: Before we get to that point, I have a few more questions I want to ask. You mentioned that your position as chief engineer of manufacturing, and it was in this position that you were the so-called fall guy.

Dittus: Yes.

Marcello: Now describe for me, other than the streamlining that you were required to do, what your functions were at this time. What exactly were you doing?

Dittus: My functions were to coordinate and supervise in each one of the refineries the activities of the chief engineer. This included the technical service given to the manager at the refinery, the maintenance service given to the refinery (the maintenance organization). That was essentially it-- those two functions.

Marcello: Now were these refineries strictly the California refineries?

Dittus: No, they were the California refineries and also, in a remote way, the El Paso refinery. It was up to me to see that they were fed with replacement personnel for training for higher positions later on and the like.

Marcello: Now what role, if any, did you play at this time in the actual designing of refineries?

Dittus: The actual designing of the refineries was controlled by my office, and I had a staff of certain people. The drawings and the like were parcelled out to the drafting room at El Segundo and Richmond at that time. It wasn't until a little later that an organization like the Bechtel Corporation-- the contractors--came into existence.

I must correct that to a certain extent. At the time we were building a refinery up in Vancouver--Burnaby--and that refinery was handled by my office completely with a

contractor called Alco, which was a subsidiary of the American Locomotive Company. American Locomotive had an organization somewhere up in Canada--Montreal or somewhere--and the engineering was done by, I guess, Alco in New York and to a certain extent by Alco in Canada. That job was completely under my control.

It was while this job went on that Kingsbury of Socal, the president, from what I heard, decided to...well, they found the oil at Bahrain, and they had to sell the oil. Well, oil was a drag on the market. You couldn't afford to ship from Bahrain to the West Coast because oil was cheaper here. Yet you kind of had to satisfy the sheikh of Bahrain and give him an income. That's the way I sized it up. So Kingsbury went over to England to talk to the people that had kind of an agreement. Oh, I think they called it the Red Line Agreement. I don't know who all was in that. I guess it was British Petroleum, Royal Dutch Shell, Socony, and I don't know who all were in it. They kind of just pushed him to one corner, I guess. In any event, while he was in London doing that, I was to go to Germany. Being of German birth, I guess, it came in handy to send me over there. This was during the Depression, when Hitler was in power, and the economic system in Germany on currency was very difficult.

Marcello: This was in 1933, was it not?

Dittus: No, this was in 1935. Yes, 1935. I was to make a noise-- go to Germany and send out inquiries for refinery equipment and the like and kind of rattle the sword, you know.

Marcello: Let me back up just a minute. You mentioned that Kingsbury went to London to confer with some of these other oil companies.

Dittus: That's the way I understand it.

Marcello: And you mentioned that he was more or less shunted aside. You also mentioned the Red Line Agreement. I'd like to hear you tell me what the Red Line Agreement was.

Dittus: I don't know what the Red Line Agreement was. It was an agreement within themselves, I guess, on how they split up the exploration and the oil and the like in the Middle East. Oh, there was an Armenian in there somewhere--I can't think of his name right now--and who got the concessions from the sheikhs. He got--I don't know--a 5 percent royalty or something. I've forgotten his name; I can't think of it.

In any event, Kingsbury was unsuccessful, and instead of being in Germany a couple of months, I ended up being there from October, 1935, until about June, 1937, or somewhere thereabouts.

Marcello: So in other words, those other oil companies did not want Socal as a part of this so-called Red Line Agreement.

Dittus: Yes, that's the way I get it.

Marcello: Is this what prompted Kingsbury and Socal to decide to build

its own refinery in Bahrain?

Dittus: That's correct.

Marcello: Okay, so you were then sent to Germany. Why Germany? Why were you sent to Germany as opposed to some other country?

Dittus: All right, why Germany? Because, number one, the German government--the Hitler machine--needed oil. Petroleum was a surplus in California, particularly aviation gasoline and the like. They shipped it from California over to Germany, got credit. That credit went into an account, and we bought materials out of that account. In other words, it was a barter deal, and it was known as a barter deal for all intents and purposes.

Marcello: So Standard Oil of California was shipping aviation gasoline and the like to Germany, and they were receiving credits in a special account.

Dittus: Right.

Marcello: And is this why you went to Germany--to procure materials for this new refinery?

Dittus: That's right. That was handled through an engineering firm called Uhde. They had a staff. They were kind of a company that had some sort of fertilizer deal and designed plants to convert nitrogens to fertilizers and the like.

Marcello: Now would it be safe to say that German technology at that time was perhaps among the finest in the world?

Dittus: No, not as far as the oil refining was concerned (chuckle).

It was as far as the chemical end was concerned...

Marcello: Yes, that's what I was referring to.

Dittus: ...but not as far as the oil refining is concerned. It was very difficult to buy certain equipment in Germany for the oil refineries. That had to come out of the United States, and some of it had to come out of England.

Marcello: Well, what would you be purchasing in Germany at this time when you went over there?

Dittus: Oh, we purchased pipe; we purchased tanks; we purchased boilers. Then we purchased the complete sulphur dioxide plant for treating kerosenes, known as an SO₂ plant. We bought fire bricks and the like for furnaces, cement, and other things.

Marcello: Let me ask you this. You could've actually purchased these kinds of materials anyplace, but you purchased them in Germany because of the barter agreement, and you had the account there?

Dittus: That's right.

Marcello: That material could have very easily been purchased in the United States.

Dittus: Oh, yes. It would have been under normal circumstances.

Marcello: Another question at this point. I'm assuming from what you said that the company had no compunctions whatsoever in dealing with Hitler's Germany relative to trade and so on at this time.

Dittus: Well, I don't know whether they had any compunctions because at that time Hitler was making a lot of noise and arming, but he hadn't yet armed to the point where you could see that you were really supplying an enemy or potential enemy.

They had blackouts while we were there. I drove down the road many a time and had to trail a bunch of half-tracks and the like down the road because I couldn't get around them and so forth. Then they were building the autobahns pretty much, and that was for military purposes, but we didn't know it. At the same time, they were developing the Volkswagen because I can remember people standing around a Volkswagen. The Brown Shirts were standing there and discussing it, and they were selling stock. They were selling cars. People were putting down the money and getting the stock or some deal like that. I never mixed much in crowds; I stayed away from the crowds.

Marcello: Let me ask you this, Was this Bahrain refinery going to be the first one that Socal developed in the Mideast?

Dittus: Yes.

Marcello: Describe for me your role in the building of this refinery --the construction of this refinery--in Bahrain. What were the special problems for instance?

Dittus: There were no special problems. The designing of the refinery was done in San Francisco under the General Engineering Department. A fellow by the name of Jim Stirton was

transferred out of Richmond and moved over into the General Engineering Department in San Francisco. Going back a little bit, the General Engineering Department in San Francisco up until this time, 1934, handled all the engineering for everything except the manufacturing. The Manufacturing Department had its own engineering organization. The chief engineer of the General Engineering Department was a fellow by the name of H.H. Hall, who was born on July 4, 1883--I've forgotten--or somewhere around that time. Russell was the chief engineer of the Manufacturing Department in the 1920's. There was no love lost between us. Well, these guys are gone and I'm retired, so it doesn't make much difference (laughter). There was no love lost between the two. I found that out in 1923 when I was between my sophomore year and my junior year. I thought, "Well, Fred, you can go ahead and get a job out in Richmond. Why don't you go and get a job in the General Engineering Department in San Francisco and see what that's like?"

So I went over to San Francisco before the end of the freshman year and saw H.H. Hall, and I said, "How's the chance of getting a summer job?" He says, "You're welcome." I said, "Fine." Then I went out to Richmond and saw Russell, and I figured I'd better tell him what I was going to do and ask his permission. It's a smart thing that I did (chuckle). I went out there, and I told him my sophomore year was over,

and I thought maybe it would be nice for me to get experience over there. He just told me point blank, "If you go over to the General Engineering Department, you'll never come back to the Manufacturing Department." So I said, "Okay!" I wasn't going to sacrifice that.

Incidentally, I later fell into the hands of, so to speak, H.H. Hall, and he was a gentleman in every respect. But I never told him. I know one time something came up about Russell, and I was bitter about it--a matter of a raise. I was handed a measly \$25, and I felt like saying, "Go and jump!" But I never told H.H. Hall, who reported to Russell, about that statement, and it's probably just as well I didn't because it wouldn't have helped matters. It wouldn't have helped me, either. So my lot in the Standard Oil Company wasn't all roses.

Marcello: Now at this time, that is, when you were the chief engineer of manufacturing, where were you located?

Dittus: In Richmond.

Marcello: You were still in Richmond.

Dittus: Yes.

Marcello: And how much time did you spend in Germany altogether securing equipment for this refinery?

Dittus: I was there from October, 1935, until June, 1937.

Marcello: So it was during that period that Caltex was actually formed.

Dittus: That's right.

Marcello: It was formed in 1936, isn't that correct?

Dittus: Oh, yes, that's right. That's right. I was over in Germany in 1935. I went out to Bahrain in January, 1936. Then I went out to Bahrain again on a two- or three-month trip in 1937. Okay, now I can help you a little bit, I think.

Marcello: Let me ask you this. First of all, when you were in Germany, how would you describe doing business with German businessmen at that time.

Dittus: It was no problem doing German business. The problem was their cartel system.

Marcello: Can you elaborate on that?

Dittus: Yes, I'll elaborate on it (chuckle). For example, if we had an order for a bunch of pipe or tanks, they have in Germany a cartel system which means that if one guy bids on a job, the rest of them will kind of fall in line on price and the like. The guy sets the price.

Marcello: Now this is a practice that is considered illegal in the United States, correct?

Dittus: That's right. That's right--as far as I know. In any event, as an example, I was given an order for a bunch of tanks and sent out an inquiry. The Uhde engineering firm sent out the inquiry to several tank manufacturers. You received no reply. So I got after Uhde, and I said, "Why is it we don't get a reply?" Then I went to some of the representatives that I became acquainted with and called them and asked, "Why don't we get a reply?" They said, "Well,

the agent of some steel company in San Francisco is negotiating with the San Francisco office--direct. They're going to be bound by whatever they do; they won't bid." So I relayed that to San Francisco, and San Francisco kind of said, "That wasn't true." Well, going around telling them that, that's no good. That was a little bit later when Thornburg was the--I'm kind of jumping ahead a little bit--when Thornburg was the top man in Caltex as far as refining was concerned, and he came over to Germany. It happened at that time.

Oh, Stahlunion was the outfit. We went over to Berlin and talked to this Stahlunion fellow, and he says, "Well, I have a commitment," and the like. Thornburg bristled at that. So he telephoned, which was not very satisfactory in those days--telephone communication--with San Francisco, and San Francisco said, "Not true." So Thornburg said, "The dickens with that guy! You just go ahead and place the order with an outfit called Wilke." Boy, Stahlunion resented that because it made a monkey out of them in the German cartel. The guy hated me. He told me plainly when I left, "Boy, I'm glad to see you go." He didn't like it.

Marcello: And is it safe to say that you ran into this cartel system in whatever you were procuring there in Germany for the refinery?

Dittus: No, the cartel system was essentially for pipe and steel

and the like. The others were competitive; I didn't have any problem. Tank and steel is the big volume order money-wise, see.

Marcello: Yes.

Dittus: The rest of it is peanuts, so to speak, in comparison to that.

Marcello: In procuring this equipment for the Bahrain refinery, under what kind of constraints were you operating so far as the San Francisco office was concerned? Did you have a lot of leeway and freedom, or were your activities being closely monitored and coordinated.

Dittus: No. I cabled the prices to San Francisco, and they decided what was to be placed where. I didn't decide. I was just the handyman sitting in the office handling cables more than anything else.

Marcello: The Bahrain refinery would have been the first Middle Eastern refinery that Standard Oil was constructing.

Dittus: No, the one up at Vancouver was the first foreign refinery that I know of.

Marcello: Certainly this was the first one being constructed in the Middle East.

Dittus: Yes.

Marcello: Was the Bahrain refinery being viewed, then, as a model, so to speak, for future refineries or anything along those lines?

Dittus: No, not necessarily. It was to dispose of the oil that was developed on the island of Bahrain, which disposal was limited. I've forgotten what it was, but it was rather limited.

Marcello: So up until that time, all of the oil extracted from Bahrain had to be transported by tanker or something else to some other place to be refined.

Dittus: Right. Now they couldn't ship the oil to California because it was too expensive, so they built a refinery. They had to peddle the products somewhere, and that meant that they would have had to open up their own sales organization.

Marcello: And then that's where Texaco comes in.

Dittus: That's where Texaco comes in. Texaco was headed by a fellow by the name of "Cap" Rieber. Again, this is kind of cocktail conversation and the like. "Cap" Rieber was a Dane, I think, or something. He sold oil wherever he could. Finally, I think, he got forced out of Texaco by, well, certain political elements in the United States. I better not put it on record; I have my own opinion. He got, so to speak, bounced. He went over to an oil company over in New Jersey, and later on Socal tried to break into the marketing business in the East and got together with Rieber on this Perth-Amboy refinery. I've forgotten the name of it; it begins with an "A." In any event, Kingsbury got together with "Cap" Rieber.

Now two or three years later, one of the engineers that

worked for me at Richmond, Fred Pyle, was assigned to the Standard Oil interests on this Perth-Amboy refinery. He worked with "Cap" Rieber, and it was through him that I met Rieber. Fred Pyle lived up in the Essex House, as I remember, up in New York, and "Cap" Rieber lived there. Fred and I used to get together, and every once in a while "Cap" Rieber would come in and we'd have a cocktail. Then "Cap" Rieber would tell me that there was some fellow in San Francisco--some politician--if I heard the name, I would recognize it--who apparently had some connection with Kingsbury. It is that way that Rieber and Texaco got together and formed Caltex--a 50-50 deal where the oil was sold. Oh, Texaco sold lubricating oils and the like in India and those places but had difficulty in really selling the lubricating oil because they had no gasoline. They couldn't afford to ship the gasoline from the United States over to India and those territories. So it was an agreement which would be a mutual benefit.

Marcello: Yes. Socal had the oil, and Texaco had the markets.

Dittus: Yes.

Marcello: Now let me ask you this. In the whole process of constructing this refinery in Bahrain, you mentioned awhile ago that you also had to travel to Bahrain.

Dittus: Yes. I don't know for what purpose, whether it was just to see what was going on from an engineering point of view and

to see that the construction was progressing properly and the like. The construction was handled by the San Francisco Engineering Department.

Marcello: Did you have any contact with the sheikh or anybody of that nature while you were in Bahrain?

Dittus: Only as a courtesy. I had no political functions. That was handled by a fellow by the name of Ed Skinner--E.A. Skinner. He was the producing man and naturally became the main contact with the sheikh and the British political agent. Don't forget the British political agent; he was quite a power.

Marcello: And the British political agent was the go-between between the company and the sheikh and the royal family, is that correct?

Dittus: I don't know, but he had a lot to do with it.

Marcello: Did you have any dealings with him?

Dittus: No.

Marcello: What special problems were there in constructing an oil refinery in Bahrain?

Dittus: Well, the main problem at that time was housing. Now this was before the days of air-conditioning. The men developed boils all over their body in the summertime. Whether it was from the heat and dust or what, that was the main problem. They lived in Nissen huts. It was a camp-like existence. There were not many wives there. As a matter of fact, I

guess there weren't any except the manager and the like. Skinner, he had his family out there--his wife. The main problem was one of housing. It wasn't the men producing; they worked hard, and they worked long hours. I guess they worked long hours figuring that was the quickest way to get out of the place (chuckle).

Marcello: Am I to assume that you had no desire to live in Bahrain?

Dittus: Absolutely! I didn't have any desire. I knew my wife was not fitted for that kind of a life. I was at one time asked to go up to Bahrain to relieve the chief engineer for a matter of three or four months. I refused. I flatly refused. I just figured I would lose my job. My wife wasn't built for that. It takes a special kind of a wife. No question about it.

Marcello: So you really had very little to do, then, with the actual construction of the Bahrain refinery outside of the procurement of material in Germany.

Dittus: That's essentially correct, yes.

Marcello: Like we mentioned awhile ago, Caltex was formed in 1936, and you gave your version as to how it got organized. What effect did the formation of Caltex have upon you and your position with Socal?

Dittus: Well, I knew which way the wind was blowing in San Francisco. I knew that Thornburg said, "Why don't you work for me in New York?" I decided, "Well, I'll take the chance of

working in New York rather than go back and in effect be demoted. Really, I didn't go with any enthusiasm. Thornburg was in New York. My furniture was shipped out by my successor, who lived in my house in Berkeley, and went to New York.

Marcello: I'm a little vague on a few things here. You mentioned that if you had stayed with Socal in Berkeley or in that area, you would have in effect been demoted. Can you explain what you mean by that?

Dittus: I mean exactly that! I don't mean anything else. The fellow that took my place was a fellow by the name of C.F. Hansen, who, incidentally, is still alive. He lives in Santa Barbara. I hope he never hears this recording. He was a good friend of mine. When they built the refinery at El Paso in 1928, I was sent down there to assist the construction superintendent in engineering and the like and assist the manager of the refinery with whom I had worked in designing the refinery. Maker was the head guy in designing the El Paso refinery for Socal, and I worked for him. I was sent down there, and I got along fine with the manager. The assistant to the manager was R.G. Follis, who was the stepson of Kingsbury. Follis's mother married Kingsbury. Kingsbury was a graduate of Princeton. That's where Kingsbury went, and that's where his stepson, Follis, went.

When I came out of El Paso, I was transferred to El Segundo. This fellow Hansen had been working at El Segundo,

and he was transferred down to El Paso to become the resident engineer for the manager. He became "buddy-buddy" with Follis, so he was a fair-haired boy of Follis. I knew Follis very well because he and I made many a trip back and forth from Richmond to El Segundo and shared the drawing room, believe it or not. He loved traveling in the drawing room, so I split 50-50 with him on the fare. The expense account showed just a plain berth, and I absorbed my difference. He was a good guy; I liked him.

In any event, I was persona non grata--I could tell that --so I went with Thornburg. My stuff was shipped. Then something happened, and Don Hanna was to be the assistant to Thornburg in New York. We were both to be stationed in New York. Lo and behold, about the time my furniture and everything got to Chicago--and in those days it was shipped in big boxes--the word came around that Hanna and I were to go back to Socal. Something happened politically between Texas and Socal--I never knew what--and we were shipped back. My furniture was turned around and sent back to the same darn house.

Marcello: So you were back with Standard Oil of California again?

Dittus: Yes.

Marcello: Now how did it affect your job--your status and position and so on?

Dittus: Oh, I was transferred to the General Engineering Department,

and I became a section specialist, so to speak. I handled all of the refining design work in the General Engineering Department under the chief engineer, H.H. Hall.

Marcello: Is this when you were in essence named as the chief designs engineer?

Dittus: It could be. I don't know (chuckle).

Marcello: Was it a demotion?

Dittus: I figured it was, yes.

Marcello: Why was that?

Dittus: Well, because in one case you worked direct for the general manager of the refineries, while that way you were kind of in a service organization. It had an effect upon my spirits because I enjoyed the work. It was a bigger department, and it was in San Francisco. I really enjoyed it and did quite a bit in developing engineering. I became acquainted with contractors like Bechtel. It was Bechtel, McCone, and Parsons at the time, McCone being the CIA chief later on. I knew John very well. I knew him from my El Segundo days because he was the agent for Foster-Wheeler when he was working for one of the steel companies in Los Angeles. I've forgotten what John was doing. John McCone was the son of a machinery dealer in Los Angeles, and he had money.

Marcello: Now were you working in company headquarters in San Francisco?

Dittus: Yes, the headquarters of the general engineering.

Marcello: But, I mean, were you in the same building where the general

offices of Socal were located?

Dittus: Yes, yes. It was all in one building then.

Marcello: Last night on the telephone, you on several occasions mentioned the "18th floor." Explain a little bit about what you were referring to.

Dittus: (Chuckle) Well, the 18th floor was the floor where Kingsbury had his offices and where the vice-presidents had their offices. When you went up on the elevator, why, there was a colored man there that let you off the elevator. If he knew you, you told him, "I'm to see So-and-so." You could then go and see So-and-so, and when you got to the door, there was a little button underneath the door knob, and you pushed it up and twisted it, and you could walk into the director's office. Presumably, arrangements had been made for you to see him; you didn't just barge up there on your own.

Marcello: What relationship did your department have with the 18th floor?

Dittus: My department had none! My department was within the general engineering department, which reported to H.H. Hall. H.H. Hall is the fellow that had the contact with the 18th floor.

Marcello: So in essence you never got to the 18th floor.

Dittus: No, only once or twice by invitation.

Then as things straightened out and the war came along, we worked during the war, and somehow or another, in 1944, Don Hanna went back to New York. The picture of the war

being over and the market expanding into Europe and the like came up, and they could foresee where they were going to build refineries over there. So I was asked by Lindsey Hanna about going there. He said, "I want an answer tomorrow." Hell, I knew what that meant--either "yes" or "you're done for."

Marcello: Let me back up a minute. Let's talk about your activities during World War II. How did World War II affect your activities as a designs engineer with Socal?

Dittus: Well, in World War II we had jobs coming up like building a refinery up at Whitehorse, Canada, which brought oil from the interior of Canada somewhere. Earlier we were talking about viscous flow. This was viscous flow; it was waxy oil. It went down to Whitehorse. Roosevelt and the premier of Canada feared an invasion, I guess, from the Japanese into Alaska. They knew they wouldn't be able to ship oil up to Alaska to defend it, so they built this teapot refinery to make aviation gasoline. Half of the oil that went through the pipeline was used up in making the oil and heating it and keeping it hot. It was economically unsound. It was handled by the Army. The contractor on that was Bechtel. Bechtel had the job with the Army.

Standard was assigned the job of following the building and the construction of the refinery, which was financed by the Army. We were to follow Bechtel on the design. After

all, they were just engineers--newly created, almost. I had to go over there and teach them how to organize their engineering job. As a matter of fact, I told John McCone in front of everybody one time, "Well, John, what are you doing is asking me to go and run your engineering department." He says, "Well, yes."

Marcello: So this is when Bechtel initially gets into the actual construction and building of refineries?

Dittus: No, they built one job in 1935 at Richmond, and that was the first job they had. But this was the first time they had it on a large scale.

Marcello: What kind of a working relationship developed between Social and Bechtel over the years?

Dittus: Well, a very friendly relationship. Steve Bechtel was a marvelous man; he was a salesman. He was one of the guys at the University of California in 1923 and lasted, I think, one semester, but I'm not sure. Incidentally, along with him were two or three Witter boys. You know, Dean Witter--the brokerage house? They finished their four years. Steve knew the Witter boys very well. I never knew them, but Steve did.

Marcello: During the war was there ever any problem procuring materials for the construction of refineries, or was that given a top priority by the government?

Dittus: No, the top priority went to the Manhattan Project (chuckle).

Marcello: (Chuckle) Oh, yes.

Dittus: I was the guy that handled the whole darn thing in the General Engineering Department. I'm the fellow that scheduled the designs job, the manpower Bechtel needed, and the shipping and the like. Also, the purchasing was done, of course, in the United States by the Purchasing Department of Socal. I was able to work out with the Purchasing Department...I developed, number one, a system of ordering so you could tell just from the order number almost what the item was because in the Purchasing Department they had different groups. One handled the toilet paper, and another one handled the paper clips, and the other one handled the tanks and the like. So I developed a system of scheduling and organizing the shipping. There were just certain ships at certain times.

I kind of sized up the situation, and I ordered tons and tons of steel plate ahead. I didn't know just how it was to be used, but there it was, on paper--so much steel was on order, such-and-such sizes. Then as the engineers designed the equipment, they wrote out the orders. One fellow in the Engineering Department kept the books on these steel plates and the like, and he'd specify which had a priority--a government priority. But the priority was second; it was down the line from the Manhattan Project.

Incidentally, I was invited to partake in the Manhattan Project, only I didn't know what it was. I knew it was

super-secret, and being of German birth I decided to stay out of it.

Marcello: What connection did you have with the Manhattan Project?

Dittus: I didn't have any. I knew that the Kellogg Company was the main contractor under General Groves. I knew the fellow that headed it up, Dobie Keith. He headed it up. I had worked with Kellogg when they designed a distillation unit for Richmond. That was in 1932 or somewhere thereabout. So I knew Dobie Keith very well, and Dobie wrote me a letter and asked me, but I said, "No, thanks!" I had my doubts in the First World War, and I didn't want to get involved. I was content living in California.

Marcello: According to the record, you actually joined Caltex in 1944. Is it correct?

Dittus: Yes, that's correct.

Marcello: How did that come about?

Dittus: Well, I don't know how it came about, except, as I told you, Lindsey Hanna told me, "There's a job, and you'll be a big frog in a little pond," or words to that effect. He said, "I want the answer the next morning." I went home and told my wife, and she wasn't enthusiastic about it. But we went. It wasn't easy--it was during the middle of the war--getting a house and the like. But I took it, and it's a good thing I did.

Marcello: You became chief engineer.

Dittus: Yes.

Marcello: And you had moved to New York?

Dittus: Yes.

Marcello: Now what were your responsibilities at this point?

Dittus: My responsibilities were to furnish technical advice to the general manager in New York on estimates and the like. My responsibility was to always have available a staff of engineers for rotation to Bahrain. The fellows came out on long leave in those days. That was before you had jets, and the fellows came out for three or four months, every two or three years. You're speaking of during the war?

Marcello: Yes.

Dittus: Well, that was about it.

Marcello: What changes took place so far as production was concerned in Bahrain during the war? Did you have any connection or association with production changes that occurred in Bahrain?

Dittus: No.

Marcello: How about in the construction of pipelines. Would you have gotten into that activity?

Dittus: At Bahrain, but not otherwise.

Marcello: How about the Arabia-Bahrain pipeline? What association did you have relative to its construction?

Dittus: I'm just trying to figure out whether I had anything to do with that. My memory is vague on that. It was handled, I guess, by Caltex, but that's just vague now. It was in

the early days. Yes, I think it was handled by Caltex. It was contracted to Bechtel. I'm not sure whether we handled that ourselves or not. I've forgotten.

Marcello: Now in coming up to the period immediately following World War II, I'm assuming that there were a lot of refineries that had been damaged during the war, perhaps those in Europe and so on and so forth.

Dittus: The only one I had anything to do with was the Texaco refinery at Bec d'Ambes down in Bordeaux. That became kind of an involved job. We set up an engineering group that worked on the problems over there. The job was handled by a contractor, Arthur G. McKee, in Cleveland. He had done some work prior to the war in Europe. They had a man over there that knew Europe pretty well. They supplied the top labor, and we hired local labor. It was handled by an engineer stationed at the Bordeaux refinery with local contractors and key personnel sent over from the United States from the Arthur G. McKee Company.

Marcello: What kind of dealings would you have had with French authorities during this rehabilitation?

Dittus: I didn't have any. That was handled by the Texaco office in, I guess, Paris. I don't know; I didn't get into that at all. That was outside of my territory.

Marcello: Now all this time, you were essentially staying in New York and working out of New York.

Dittus: That's right. I never left New York except on trips to Europe, and those were few and far between.

Marcello: In the period after 1946, Caltex undertakes a program of refinery expansion. There were a whole lot of refineries that were built in that period after 1946.

Dittus: That's right.

Marcello: Describe what you know or discuss what you know about the decision or decisions to undertake this refinery expansion, whether we're talking about Europe or other sections of the world or whatever.

Dittus: I had nothing to do with it. That was all settled by the board of directors between Socal and Texaco. My job was to furnish the estimates of what it would cost and how long it would take. Once it was approved, my job was to pick the contractor, make the arrangements with the contractor, do the designing, and furnish the assistance needed on key personnel and the like. I had my own men from my own staff to be resident at the job site and work with the contractors and with the authorities through the local manager of the sales organization because he lived there all the time. There were arguments going on--not between me--between some people as to whether these refinery managers should report direct to the refinery manager in New York or whether they should be responsible to the local manager and the like. I personally always thought they should be responsible to the local manager

and functionally to New York. Certainly, I worked that way on the engineering end of it. But I was out of that, and I'm glad I was.

Marcello: I don't know exactly how many refineries were constructed during this period, but I know that there were a whole lot of them. Is there any particular one that stands out in your mind for special problems or whatever?

Dittus: No. I was pretty well versed in it by that time, having had all of this business in the United States during the war. Well, there were problems, but they were not insurmountable problems. I had problems with the aviation project--the aviation gasoline project--in Bahrain mainly between the contractor that handled tank welding and the like and the Bechtel organization that sent their own personnel over there to do the welding on a great big cracking vessel, a reactor. But that was not after 1946. That was during the war.

Marcello: That was during the war.

Dittus: Yes, that was during the war. Backing up, it was my job in the General Engineering Department to work with Bechtel on the construction end of it. I'd schedule all the manpower and the like. There was an argument between Chicago Bridge and Iron that built the tanks...they were better in welding a great big vessel even though it was in the process area, and I had a problem getting Chicago Bridge and Iron to do it

for Bechtel. I had a problem with telling Bechtel that we were better off to have the welding of that done by Chicago Bridge and Iron. That was the biggest political problem, and it was a matter of pride between the two. Don Hanna was in New York, and I dealt with him on the problem of building this refinery--this aviation unit--during the war in Bahrain.

Marcello: Is this one of the first experiences you had had relative to the designing of a refinery to handle the production of aviation gasoline, or did you have this at other places, too?

Dittus: Well, I had a little experience with that refinery up at Alaska. The answer is "yes." That's the first one.

Marcello: Is there anything else relative to the construction of that refinery to produce aviation gasoline that stands out in your mind?

Dittus: Well, it was a new art. It was just the problem of building any new process, any piece of new equipment. The Research and Development Department pretty well knew the process itself, and we knew from them what was required in capacity and certain sizes. It was just a plain matter of arithmetic to design it.

Marcello: There's a question at this point that I should have asked you previously, but I'll ask it now. What differences, if any, could you detect in the Social way of doing things

and the Caltex way of doing things, now that you were associated with Caltex?

Dittus: I don't know because once I left Socal, I was out of the stream, and I ran my own organization. I had no interference from either Texaco or Socal. It was operated as a separate unit.

Marcello: Now as this refinery expansion progressed, I am assuming that your staff or your department increased in size accordingly.

Dittus: Oh, it did.

Marcello: Talk about the growth of your organization and the development of your organization during this period of refinery expansion. For instance, did you have anything to do with the recruiting of people to staff the organization?

Dittus: No. Personnel had a team going around to the colleges, just like Socal and Texaco. Well, the outstanding one is General Electric. They had teams going long before anybody else that I know of, at least when I went to college. They were there. They had teams, and they hired technical men not only for engineering but also for research and development, what they called the Process Division, that decides on what kind of a process to set up to meet the demands in that particular country. There's lots of ways of refining the oil. In other words, the main purpose is to get the maximum out of a barrel of oil to meet the demands of the local

market situation. That's what they call process engineering. They hired men for that, and they hired men for marketing and men for the financial control and all of that. That's where I got my men.

Marcello: According to the record, I understand that your staff started out with two engineers and one stenographer and then developed from there.

Dittus: (Chuckle) Oh, that's about right. I guess the two men were Bill Tucker and...oh, I don't know. I've forgotten his name, but he worked for the Texaco Company. Those were the two men and one stenographer. The stenographer was one that was unloaded on me, and I never liked that, either, because I had to fire her.

Marcello: At its peak how many people were in this integrated organization of experts? You'd have to estimate this, of course.

Dittus: I don't know. You see, they were scattered. Some were directly under my control; some of them were under the local manager's control. Then in the London office that was set up, we tried to hire British personnel and train them. I don't know how many I had. On my own payroll, I may have had in the New York office maybe fifty. I don't know.

Marcello: You mentioned something a moment ago, and I want to pursue it further. You were talking about the recruitment and hiring of foreign nationals in your overseas offices and

so on. Was this a conscious company policy?

Dittus: Yes, it definitely was.

Marcello: What were the advantages of this so far as you could see?

Dittus: Well, instead of spending dollars, they spent local currency.

Marcello: So in that sense, it was...

Dittus: And, also, you developed technical personnel for the local operation. That was one of the main points, really.

Marcello: This brings up another question. What problems developed so far as adapting the overall plans for refineries to local conditions? How much of a factor was this in the design and building of refineries--the local conditions?

Dittus: There was no problem for me because it was the Process Division that was given the statistics of the local marketing managers as to what the market demanded. Then they were the ones who took the barrel of oil, so to speak, and decided what process they had to use to get the maximum profit. After all, it was profit that they were looking for.

Marcello: From everything that you've said so far, Mr. Dittus, I'm assuming that your part of the Caltex operation was more or less insulated.

Dittus: That's correct. I was assigned a job and left alone, and I executed it.

Marcello: In other words, somebody else made the decision to build the refinery and came up with whatever specifications they

felt were necessary, and then you, in essence, executed the job.

Dittus: I think the way that thing worked was that within the Caltex organization in New York, they found by financial analysis that they needed a refinery, and then that was brought up in a joint board meeting, which occurred maybe two or three times a year. Maybe there were also special meetings. They would decide that they should build a refinery, and then the decision was approved by the two parents. Then the Caltex organization in New York executed the decision. They decided to build it, and Caltex then had to plan the financing of it, with which I had nothing to do. Then it was given to me to execute and build a refinery. Then help in staffing the technical end--the engineering, maintenance, and the like--of that refinery was under the direction of the local manager, who generally was a refining man. He was responsible to kind of what you might call a local board of directors, which was the marketing organization.

Marcello: Let me ask you this. In this postwar refinery expansion program, were there any new construction or transportation methods that were developed in your end of the operation?

Dittus: None that I can recall at the moment. No, I can't recall any change.

Marcello: Were there ever any common construction problems, that is, problems that were common to all of these refineries that

developed in this postwar period?

Dittus: Well, there weren't as far as Europe was concerned. There weren't any problems. But as far as Australia was concerned, there was a problem, and that was labor. At the time we built the Australian refinery, the unions had the upper hand. It was very difficult to operate on it because of, oh, tea breaks and all of that kind of business. But, again, the fellow that was in the field had the problem. In that particular case, the fellow in the field was a fellow by the name of Ray Parker, who worked for me at Socal in El Segundo back in the 1930's. He had problems galore, but the fellow in New York that sat on the marketing end of it, well, he just told us we didn't know how to handle it, that all we needed to do was buy a keg of beer, as he put it. Well, it wasn't quite that simple. You couldn't pacify those guys with a keg of beer. Times had changed since he left Australia. I don't think his advice was accepted by the board of directors there in any event. So from that side I had no problem, but I did have them in the field--quite a few. Ultimately, we got it done, but it was behind schedule.

Marcello: So your office would be responsible for the actual hiring of people and so on to build the refinery wherever it was located.

Dittus: Oh, yes, we hired local labor. We hired local labor, and the contractor from the United States supplied top personnel--

the foremen, so to speak. Australia was far enough advanced to have pretty good-sized contractors.

Marcello: At one point in your career, you were promoted to vice-president, then chief engineer of Caltex, and then later on vice-president of the Technical Services Division. Okay, how did your role within the company change as a result of those promotions?

Dittus: Within the company it didn't change one bit. In effect the Process Division was run by the same fellow. He reported to me instead of reporting to the vice-president of refining. The other area turned over to me was the Purchasing Department. Well, that was okay because in a way I ran the Purchasing Department, anyway (chuckle). I wrote the orders and told the Purchasing Department I wanted it bought and kind of watched them to see where they bought it; so although I didn't run the Purchasing Department, in effect I ran it.

The same thing was true in San Francisco, as far as the purchasing for construction was concerned. I didn't run the Purchasing Department in San Francisco, but the fellows that worked in the Purchasing Department had several departments. There were only two or three that were actually active in the purchasing of refinery equipment, and we got along fine. We had our bull sessions in the evenings after working hours. We went down all the orders and saw where they stood. It was a very cooperative spirit in Socal, and it was that way in Caltex.

I wasn't the most cooperative guy, I guess, but I took the lead and decided if, for example, this engineer wasn't feeding in information or the Purchasing Department wasn't doing that. The minutes were dictated; there was a stenographer sitting there taking the minutes and typing them up the next morning.

We operated without the bosses. In San Francisco the manager of the Purchasing Department didn't know. He went home. But during the war we worked. We worked until nine or ten o'clock and then some, and we didn't have a martini before, either.

Marcello: Is it accurate to say your responsibilities functioned more smoothly as a result of your taking over the Purchasing Department?

Dittus: No, because I had no problems in the Purchasing Department. I don't know. Maybe the fear of God had something to do with it (chuckle) because I didn't hesitate to call a spade a spade, but not with maliciousness, to tell somebody to get off their "dime." Then I think I probably had a certain amount of reputation that caused them to say, "Well, that's for the Engineering Department. We'll get the job done." There was a liaison.

There were no problems due to the fact I took them over. We had a session every Thursday morning. We all sat around for an hour and discussed what was to be done. There were

no problems. The only problem I had was with an engineer by the name of Ed Howard, and he fiddled around with electronic computers way back when you didn't even know computers. He kind of talked "computers, computers," so I had had it with computers. I could never get Ed Howard to put down on one page what I could get on one page. He took about a dozen, and he talked that way. He drove me nuts. That was finally turned over to the Accounting Department, and I was glad.

Marcello: Let me ask you this. Getting back to the construction of refineries and the expansion of the whole system of refineries, what role did you play in the negotiation of the actual construction contracts themselves?

Dittus: I'm the guy that negotiated them.

Marcello: Okay.

Dittus: I had no interference from that side. I negotiated, and I cleared it through the lawyers and got all of that. I worked right with the top guy. I worked with Steve Bechtel. I worked right with the top guy. I worked with Steve Bechtel. I worked with the top fellows. I had no problem. I commanded a certain amount of respect in my business. I'm not bragging, but I did mainly because I tried to be reasonable. The contractors made good profits. Their overheads were taking care of many things--I knew that--but then I also knew that if I went to any other contractor, I'd face the same problem.

For example, I knew Steve Bechtel personally. After we went out to Richmond in the 1930's, and we came back to San Francisco, we'd go into a "greasy spoon" and by ten o'clock or 10:30 we were back there. We had a cup of coffee and a doughnut together. So I knew the fellows. I knew John McCone. I could call them by their first names. There was no problem. I think I was pretty well-known in the contracting business, perhaps even better than Texaco. I don't know.

Marcello: Was Bechtel perhaps the prime contractor for most of the refinery construction? Not that it was the only one, but was it the prime contractor?

Dittus: He only was in Bahrain. I don't think I had Bechtel anywhere else. It only was Bahrain where I had Bechtel. The other I had were Foster-Wheeler, Arthur G. McKee, the Lummus Company--all of those outfits. Bechtel didn't have any organization in London. That was kind of a mistake on the part of Bechtel. They did later on, I guess. But Bechtel was by that time pretty well occupied with Arabia. We had them at Bahrain. He'd submit bids.

As a matter of fact, he came in with a bid...he started to have a power department--electric power--and we were increasing the power plant, and he hired the top engineer from Consolidated Edison in New York. I've forgotten the guy's name, and I don't know that I ever met him even. But

he came in with a bid that was way out of line--unreasonable. It was on the low side. So I called up Steve Bechtel, and I said, "Steve, you better have your guys review that contract because it just doesn't sound right to us. You're going to come along and ask for some extras." He got the point. There wasn't much point to it; it was plain. In other words, it was too darn low. But he came back, and he said his boys swore by it. I said, "Steve, if they swear by it and you take it, okay." I went up and told the vice-president, "That bid is low, and frankly, between the two of us, I called up Steve Bechtel and told him it was low. He comes back and says, 'It's right.'" I said, "I'd give him the job. It's his problem."

I had no problem with the people upstairs--none whatsoever. If I had an estimate, I'd go tell them, "That's it. If you go head and cut it, you can cut it; but you're going to go to the board afterwards and ask for more money." I had developed a forecasting system in Socal--not in New York so much, but in Socal--and I knew from my analyzed histories the costs of jobs and systematized it. I knew what I was talking about on that, and my men knew. They had the book, and they knew. After inflation came along, I don't know what they did. That wouldn't have been a problem to me, too. But I had no problem with the board.

I ran my unit, and I trained my men. There'd be a

report on each of them, and if the man didn't fit in, I'd get the guy in the office, and I'd say, "Look, Jim, I really think you'd fit in better someplace else. I think if I were you I'd take the next three months and look for another job and quit." Then I said, "You take off all the time you want to." Then I had my secretary check up and see how much time he took off. If he wasn't looking, if he wasn't taking time off and he wasn't looking, I'd get him in the office, and I'd say, "Now do you understand that?" The guy would say, "Yes, I understand it, Fred." One of them I later met at a cocktail party somewhere. He went out and became a professor at Cooper Union College over in Brooklyn. He became a professor there, and he thanked me for essentially firing him. But that's the way I operated.

Well, you know, after I left Tucker became ultimately the president and chairman of the board of the outfit. Then I had Hal Lewis. Then I hired a guy from Columbia who was not an engineer; he was just a graduate, and he worked in the dean's office at Columbia. I hired him and made him the chief clerk. I was going to train somebody in the chief clerk's office that would be ultimately worth more, and he became the manager of Bahrain, ultimately. I've forgotten his name. I had about four or five guys that under Tucker later became vice-presidents of Caltex. I don't know whether you have a roster of them.

Marcello: What kind of a person were you looking for to work in your operation?

Dittus: Well, the recruiting team picked them, and they were picked from the top grades. They were put into a team. For example, they were turned over to the drafting room, and that was understood when I hired: "You work in the drafting room, and the minute you can make a drawing--a decent drawing--and understand it, out you come. The chief draftsman who worked for me in San Francisco, worked with me--a fellow by the name of F.U. Rose.

Marcello: So there was a procedure, then, by which people advanced in your department, beginning in the drafting room and going from there.

Dittus: Yes, very definitely. The minute they could take other responsibility, they were given responsibility. But then, also, I was fortunate in the respect that these new refineries demanded personnel in the refinery--technical personnel--and I was able to feed them out, and they enjoyed going out. To them that was adventure, I guess. I don't know.

I didn't have any lemons to speak of. I think once I inherited a fair-haired boy from Socal in the Engineering Department who married some gal that was the daughter of some guy in--I don't know--City Gas and Electric or someplace else, but they were no problem. They were only problems when it came to being a little more generous on the expense

account.

Marcello: Mr. Dittus, you retired on January 1, 1963, from Caltex. Could you have continued to work longer?

Dittus: No, no, there was no choice, and by that time I kind of eased myself out. I started to work on a pet project of my own with my secretary operating the calculating machine. It was known, but nobody stopped me. I had a free hand; I had nobody dictating to me. I enjoyed it. As a matter of fact, except for this Depression business, I enjoyed it. I guess I was just the natural-born engineer--period. I'm enjoying it to this day. I'm working on problems of mine own that go into physics and the like, and I keep my mind occupied, and it's a good thing I do, I guess.

Marcello: You mentioned that you had a project of your own going during those latter years that you worked for Caltex. Would you care to elaborate on that?

Dittus: Well, in physics there's a fundamental problem that says that the pressure times the volume is the constant times the temperature. But it isn't quite so simple except when you have very low pressures and very great volumes. As you compress things, the molecules start to interfere with each other. The problem I'm working on is to separate what they call the internal energy or the kinetic energy from the external energy--the pressure times the volume. You have to be a physicist to understand it. I doubt whether many of

my engineers would understand it. But then that doesn't mean I'm brilliant. It just happens to be that when Maker and I went to these physics classes in California, I got somehow or another intrigued with the problem--although I never worked at it until later on, just before retirement and since retirement.

I have a few booklets of my own that have never been published, but I have put them in bound form for my own reference more than anything else. I enjoy doing it.

Marcello: Well, it's probably a good place to end this interview.

Mr. Dittus, I want to thank you very much for having participated. You've said a lot of very interesting things, especially relative to the early days of Caltex, and I'm sure that your comments will be most valuable.

Dittus: Well, when you cut off the machine, I'm going to speak off the record.